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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/800,281
Filing Date: March 12, 2004
Appellant(s): NEAL ET AL.

Nathan E. Stacy
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 9/3/2009 appealing from the Office action mailed 5/7/2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US Patent: 6,965,076	Wu	11/2005
US Patent: 5,615,081	Ma	03/1997

US Patent: 5,865,546	Ganthier et al.	02/1999
US Patent: 6,587,094	Anderson	07/2003
NPL	Sheehan	11/2003

(6) Grounds of Rejection to be Reviewed on Appeal

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 6-15, 19-20 and 24-26 are rejected under 35 U.S.C. 103(a), as being unpatentable over Wu (US Patent: 6,965,076) in view of Ma (US Patent: 5,615,081).

As to claim 1, Wu discloses a keyboard enclosure comprising:

a first cavity (i.e. the cavity that is formed by the entire volume area of the upper and lower enclosure) in which a circuit (i.e. the electrical circuit) can be disposed, the circuit include a first node and a second node both of which correspond to a key (i.e. in order to connect the key stroke two node is created on the circuitry membrane where a key press will activate the separate portion of the circuit), wherein the circuit is operable to generate a signal when the key causes the first and second nodes to contact each

other (i.e. the key is pressed down by the user which bring the two node together and activate the signal for the character input specific to the key) (see Fig. 2C, Col. 6, Lines 7-9);

a region forming a second cavity (i.e. the cavity that is formed only by lower enclosure which house the actual top holding cover, circuitry, and bottom holding cover) (see Fig. 2d, Col. 5, Lines 27-55);

and a node support (i.e. the electrical circuitry membrane that is located in the lower enclosure) located in the second cavity (i.e. the lower enclosure) and operable to support the second node of the circuit when the circuit is disposed in the first cavity (i.e. the top module which include rubber sheet and the switches over the sheet) (see Fig. 2d, Col. 5, Lines 27-55).

However Wu does not explicitly teach the second cavity in a lower enclosure for stiffening the lower enclosure and for providing a passage for one or more cables that electrically connect the keyboard to a processor. Ma teaches the second cavity in a lower enclosure for stiffening the lower enclosure and for providing a passage for one or more cables that couple the keyboard to a process (i.e. the two cavity in the laptop computer that support the keyboard which allow the cables to pass through, where the same design has the effect of strengthening the bottom of the keyboard layout by increasing mechanical support and making the keyboard structure more rigid also since the cable shown in figure 1 that extend from the two half of the keyboard units extend downward clearly into the two cavities 111 whereby it can be connected to the

processor of the laptop computer therefore allowing the input to take place. In this way the cavities allow for the cable that electrically connecting the keyboard sections to the processor) (see Ma, Fig. 1, Col. 2, Lines 4-56).

Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to have applied the additional bottom support cables pass through design of Ma into the keyboard design of Wu in order to adapt Wu's keyboard to a compact mobile computing application where the keyboard can be both compact and large in size when in deployment for more comfortable usage (see Ma, Col. 1, Lines 35-53).

As to claim 2, Wu teaches the enclosure of claim 1 wherein the enclosure includes one cavity (i.e. there is one overall cavity in the lower enclosure which contain the main QUERTY keys membrane) (see Fig. 2c and 2d, Col. 5, Lines 27-55, Col. 6, Lines 7-9).

As to claim 3, Wu teaches the enclosure of claim 1 wherein the second cavity has a substantial U-shape (i.e. the second cavity formed by the lower enclosure is a substantial u-shape) (see Fig. 2d, Col. 5, Lines 27-55).

As to claim 6, Wu teaches the enclosure of claim 1 wherein the enclosure includes thirteen node supports, each disposed in the second cavity (i.e. there are at least thirteen node one for each key since the QUERTY keyboard has at least 26 nodes support in the bottom cavity which support the 26 keys in the alphabet) (see Fig. 2d, Col. 5, Lines 27-55).

As to claim 7, Wu teaches the enclosure of claim 1 wherein the node support has a cylindrical shape (i.e. each of the node in the lower enclosure are off cylindrical shape) (see Fig. 3b).

As to claim 8, Wu teaches the enclosure of claim 7 wherein the node support is hollow (i.e. since the electrical contact on the membrane must have some space for connection and disconnect based on key press it must be hollow) (see Fig. 2d, Col. 5, Lines 27-55).

As to claim 9, Wu teaches the enclosure of claim 1 wherein the second cavity has a substantial U-shape and a bottom wall, and the node support extends from the bottom wall (i.e. since the figure 2d indicate that the metal plate is optional, this means that the electrical circuitry membrane could be the bottom layer touching the bottom wall

and the node support in such case will extend from the bottom wall) (see Fig. 2d, Col. 5, Lines 27-55).

As to claim 10, Wu teaches the enclosure of claim 1 wherein the node support includes an end located at an entrance of the second cavity (i.e. since the electrical circuitry faces upward and the key bumps are clearly at an entrance of the bottom cavity toward the top) (see Fig. 2d, Col. 5, Lines 27-55).

As to claim 11, Wu teaches the enclosure of claim 1 wherein the enclosure includes a floor (i.e. the bottom of the lower enclosure) and a rib (i.e. the separating pieces on the upper enclosure that create the different compartment key cluster) to maintain the position of the node support relative to the floor (i.e. the compartment arrangement of the rib contain the electrical circuitry thereby maintain the positions) (see Fig. 2d, 3b, Col. 5, Lines 27-55).

As to claim 12, Wu teaches the enclosure of claim 11 wherein the enclosure includes at least two ribs each operable to maintain the position of the node support relative to the floor (i.e. in fig. 3b it is clear that two ribs are used for the middle key clusters separation) (see Fig. 2d, 3b, Col. 5, Lines 27-55).

As to claim 13, Wu teaches the enclosure of claim 12 wherein the enclosure includes at least two node supports, and one of the ribs extends between two node supports (i.e. one of the rib separate the two node support lines of the function keys and the letter keys which naturally is extended between the two groups of nodes) (see Fig. 2d, 3b, Col. 5, Lines 27-55).

As to claim 14, Wu teaches the enclosure of claim 11 wherein: the cavity has a substantial U-shape, a bottom wall, and a sidewall, the node support extends from the bottom wall, and the enclosure includes at least two ribs that extend between the node support and at least one side wall (see Fig. 2d, 3b, Col. 5, Lines 27-55).

As to claim 15, Wu teaches a keyboard comprising:

a plurality of keys, each movable relative to the other keys (i.e. the keyboard is made up of movable keys) (see Fig. 2a);

a switch membrane assembly (i.e. PCB and electrical components membrane) including a plurality of circuits each having a first node and a second node both of which correspond to a respective one of the key (i.e. the keys activate the switches on the membrane when pressed that bring two electrical node into connection), wherein each circuit is operable to generate a signal when the key corresponding to the circuit's first and second nodes causes the first and second nodes to contact each other;

an upper enclosure (i.e. the upper enclosure) to hold the keys (see Fig. 2c); and a lower enclosure (i.e. the lower enclosure) to support the switch membrane assembly (see Fig. 2c). How ever, Wu does not explicitly teaches the lower enclosure including: a region forming a cavity and operable to stiffen the lower enclosure, and a node support located in the cavity and operable to support one of more of the nodes of the switch membrane assembly.

Ma teaches the lower enclosure including: a region forming a cavity (105) (i.e. the region where the support socket is situated) and operable to stiffen the lower enclosure (104) (i.e. the existence of the oval structure stiffen the bottom enclosure 104 of the keyboard by spreading the forces), and a node support (107) (i.e. the individual pass through for cable pass through) located in the cavity and operable to support one of more of the nodes of the switch membrane assembly and for providing a passage for one or more cables that electrically connect the keyboard to a processor (i.e. keyboard is connected to the rest of the computer body where the cable is allowed to pass through) (see Ma, Fig. 1, Col. 2, Lines 5-54).

As to claim 19, see the discussion of claims 15 above, claim 19 differs only from claim 15 in the addition limitation of a computer system which is taught by Ma (see Fig. 1).

As to claim 20, see the discussion of claim 1 above, Wu teaches a method for supporting a switch membrane assembly of a keyboard (see Wu, Fig. 2a, 2c), Ganthier teaches forming a cavity (105) in a region of a lower enclosure of a keyboard to stiffen the lower enclosure (104); locating a node support (107) in the cavity to support a circuit node of the switch membrane assembly (see Ganthier, Fig. 1). Therefore, the combination of Wu and Ganthier meets the claim.

As to claim 24, see discussion of claim 1 above, Wu teaches a method for generating a signal (i.e. since the membrane circuitry creates an electronic connection that is then sent to the computer it generates a signal for the computer), the method comprising:

moving a key of a keyboard to move a top node (i.e. the cap portion of the key is set on actuating mechanism which is a rubber sheet and are the top node) of a switch membrane assembly toward a corresponding bottom node of the assembly wherein the top and bottom nodes are disposed in a first cavity of the keyboard (i.e. the electrical component membrane is the bottom node and in the cavity that enclose all of the space of the keyboard);

contacting the bottom node with the top node to generate a signal (the contact by the top node with the bottom node occurs as the key is pressed) (see Wu, Fig. 2a, 2b Col 5, Lines 15-53), when the top node contacts the bottom node wherein the node

support is located in the second cavity of the keyboard (i.e. Wu teaches the lower cavity that contains the supporting structure for the key input systems) (see Wu, Fig. 2c).

Ma teaches physically supporting the bottom node (i.e. the electrical contact circuit) with a node support and for providing a passage for one or more cables that electrically connect the keyboard to a processor(i.e. the cable is directly connected to the bottom support. The two cavity in the laptop computer that support the keyboard which allow the cables to pass through, where the same design has the effect of strengthening the bottom of the keyboard layout by increasing mechanical support and making the keyboard structure more rigid also since the cable shown in figure 1 that extend from the two half of the keyboard units extend downward clearly into the two cavities 111 whereby it can be connected to the processor of the laptop computer therefore allowing the input to take place. In this way the cavities allow for the cable that electrically connecting the keyboard sections to the processor) (see Ma, Fig. 1, Col.2, Lines 5-35). Therefore, the combination of Wu and Ma meets the claim.

As to claim 25, Wu teaches the method of claim 24 wherein moving the key of the keyboard includes pushing the key toward the top node (i.e. the rubber dome sheet having restorative forces that push the key toward the top node when it is pressed) (see Fig. 2a, Col. 3, Lines 1-20).

As to claim 26, Ma teaches a keyboard that is integrated into the computer which removes the extra metal support since the structure is already present in the laptop computer where the keyboard in this design combines with a computer body therefore also eliminates a need for keyboard metal plates, making it redundant in design. (see Ma, Fig. 1)

Claims 16, 18, 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu and Ma as applied to claims 1, 15 above, and further in view of Ganthier et al. (US Patent: 5,865,546).

As to claim 16, Wu and Ma do not explicitly teach lower enclosure of the keyboard having thirteen node supports. Ganthier teaches the keyboard of claim 15 wherein the lower enclosure includes thirteen node supports (i.e. since the sockets have a plurality of pin sockets more then two it has thirteen of the pin input supports), each operable to support a respective one of the nodes of the switch membrane assembly (i.e. the pins are the node from the switch assembly) (see Fig. 1, Col. 3, Lines 1-15, Col. 4, Lines 15-54).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to have utilized the bottom socket connection design of Ganthier to the overall modular keyboard design of Wu and Ma in order to create an easier inter connection between input device for computer (see Ganthier, Col. 2, Lines 40-60).

As to claim 18, Ganthier teaches the keyboard of claim 15 wherein the lower enclosure includes a rib operable to maintain the position of the node support relative to the one or more nodes of the switch membrane assembly (i.e. since the rib is the filling material of the socket it extends between the individual nodes to help maintain the position of the pin socket so the pin will by inputted correctly) (see Fig.1, Col. 4, Lines 15-35).

As to claim 21, Ganthier teaches the method of claim 20 further comprising locating a rib in the second cavity to maintain the position of the node support relative to a floor of the lower enclosure (i.e. since the rib is the filling material of the socket it extends between the individual nodes to help maintain the position of the pin socket so the pin will by inputted correctly) (see Fig.1, Col. 4, Lines 15-35).

As to claim 22, Ganthier teaches the method of claim 21 wherein locating the rib includes extending the rib between the node support and a wall of the second cavity (i.e. since the rib is the filling material of the socket it extends between the individual node support down to the lower cavity wall) (see Fig.1, Col. 4, Lines 15-35).

As to claim 23, Ganthier teaches the method of claim 21 wherein locating the rib includes extending the rib between two node supports (i.e. the rib is the filing for the entire socket which naturally extend between any two node supports pin socket) (see Fig.1, Col. 4, Lines 15-35).

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Ma as applied in claim 1-3 above, and further in view Sheehan (http://reviews.cnet.com/keyboards/apple-wireless-keyboard/4505-3134_7-30568482.html?tag=prod.img.1).

As to claim 4, Wu teaches the enclosure of claim 1 wherein the second cavity has a substantial U-shape but does not explicitly teaches extends substantially 15.5 inches. Sheehan teaches wherein the keyboard is substantially 15.5 inches (i.e. Sheehan report the keyboard design which is 17.5 inches wide and 1.3 inch deep) (see Sheehan, Line 19).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to have utilized the form factor of the Apple keyboard reported by Sheehan to the modular keyboard design in order to clarify the actual dimension of the keyboard which also outlines the side of the cavity which contains the membrane circuitry.

As to claim 5, Wu in view of Sheehan teaches the enclosure of claim 1 wherein the second cavity has a substantial U-shape, extends substantially 15.5 inches (i.e. the Apple keyboard is 17.5 inches long and since the cavity of the keyboard is slightly less than this length it is substantially 15.5 inches, and is substantially 0.5 inches deep (i.e. the Apple keyboard is 1.3 inches deep and since the cavity is within the overall depth of the keyboard it is substantially 0.5 inches deep) (see Sheehan line 19).

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Ma as applied to claims 1 and 15 above, and further in view of Anderson (US Patent: 6,587,094).

As to claim 17, see discussion of claim 15 above, Wu and Ma teaches the keyboard of claim 15 having the lower enclosure, but does not explicitly teaches includes two legs operable to support a portion of the lower enclosure above a surface, and the region extends between the two legs. Anderson teaches a keyboard having two legs (i.e. the two bumps placed on the bottom of the keyboard to separate it from the surface below the keyboard which is visible in Figure 2) operable to support a portion of the lower enclosure above a surface, and the region extends between the two legs (i.e. since the two bumps are widely separated and placed on the corner of the keyboard) (see Anderson, Fig. 2).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to have added the two legged keyboard support design of Anderson to the overall modular keyboard design of Wu and Ma in order to create a more flexible keyboard for computer application (see Anderson, Col. 2, Lines 34-40).

(10) Response to Argument

On pages 7-13 in the ARGUMENTS, the Appellant argued with respect to claims 1-26:

(A) On page 8, the appellant argues that "Nowhere does Wu disclose the use of node support".

IN response to arguments in (A), Examiner respectfully disagrees with the Appellant's argument because the claimed language used in the independent claim 1, 15, and 19 does not limit the invention the way the specification defines such structure, rather states that "a node support located in the second cavity and operable to provide physical support"; **Wu clearly shows in figure 1a that the bottom holding plate is within a second cavity formed by lower enclosure and provide physical support to the circuitry above so that the various node can allow the user of the keyboard to press down on the key and input a character based on the actuated key that the user pressed**, this structure is a node support, and therefore, the claimed structural limitation of node support read on the prior art Wu. Also regarding claim 24 where the claim recite "physically supporting the bottom node with node support when the top node contacts the bottom node to ensure contact between the top and bottom nodes is

maintained when the signal is generated" is seen in the teaching of Wu where the key actuating mechanism and the circuitry membrane PCB are situated in the lower enclosure where the bottom structure metal plate provide physical support to the substrate above to ensure proper key input operations as seen in figure 2b in Wu.

(B) On page 10, the appellant argues that "the electrical circuitry membrane of Wu is not the same as a node support as defined in the present specification and recited in the present claim … node support is a structure that prevents the membrane from flexing"

IN response to arguments in (B), Examiner respectively disagrees with the Appellant's arguments, since the independent claims do not limit the detail structure of the keyboard made in the above argument. In fact, as the currently stated the node support can be any kind of structural element to support the node of the key element to allow contact to be made when pressure is applied so the circuitry is complete and the generated signal is created; therefore the support structure of Wu meets the claimed limitations. As to claim 15, the recitation of the "switch membrane assembly" does not change the supporting structural element in the claim and the structure of Wu still read on the claimed limitation because the membrane in set a top the physical node support metal plate which provide mechanical support to the membrane as well as the various nodes that compose the input device, where the membrane and the support metal plates are situated in the second lower cavity of the keyboard.

(C) In the last paragraph of page 10 the appellant argues that "the female connector slot is not the same as a node support".

IN response to arguments in (C) Examiner respectively disagrees, **the examiner intended to cite Ganthier, and the appearance of phrase "Ma" was a spelling error**, since Wu is previous discussed as providing the node support, the mentioning of Ganthier's structure was use as an analogy, to show that one of ordinary skill in the art can appreciate that the node support structure can be extended to have future feather for addition function. Also in the claims the structure of the support node in broad enough to read on any type of support elements that allow the nodes to be pressed and circuit contact to be made. Also the claimed limitation of physical node support is broad enough to read on any type of structure that provide support to keyboard structure from below, in which a female connector would be able to snap on to the keyboard module that sit a top it and therefore provide structural support. Therefore the prior arts Wu and Ganthier meet the claimed limitation.

(D) In page 11, second paragraph, the appellant argues with respect to claim 24 "the Examiner did not cite any element from the reference that could even hypothetically be considered equivalent to a node support".

IN response to argument (D) Examiner respectfully disagrees with the Appellant's argument based on the responds to (A), (B) and (C) since the examiner has already stated the node support of Wu meets the limitation as shown in the explanation of the early independent claim one, it was assumed that the appellant can understand that the

same structural limitation of claim 24 is also rejected based on Wu, where it is clearly shown in figure 1a, that the bottom holding plate is within a second cavity formed by lower enclosure and provide physical support to the circuitry above so that the various node can allow the user of the keyboard to press down on the key and input a character based on the actuated key that the user pressed, this structure is a node support, and therefore the claimed structural limitation of node support read on the prior disclosure of Wu. Also the since the electrical contact circuit in Ma and Ganthier is a type of further modification of the functions of the bottom cavity of Wu they do not mechanically change the support structure for the node which will still be set a top the cavity and the direction pressuring of the bottom parts of the keyboard structure requires that the support structure exists as seen in figure 1 and 2 of Wu.

(E) In pages 12-13 the appellant argues with respect to the dependent claims in the second, third, and fourth ground of rejections, "for at least the same reasons as discussed with respect to the first ground.

IN response to arguments in (E), please see the above explanation made regarding the argument (A)-(D). The Examiner respectively disagrees with the Appellant's argument for the same reason as previously addressed.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Calvin Ma/
September 28, 2009

Conferees :

/Chanh Nguyen/
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